Exploring Possible Physical Cause of Observed Increase in Electron Mobility in Indium-Tin-Zinc-Oxide (ITZO) at Hokkaido University

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Simon Edwards
Research Acceleration Initiative

Introduction

https://www.sciencedaily.com/releases/2022/10/221014135710.htm

There is good news and better news with this. First of all, congratulations to the Hokkaido team for discovering this compound, which I am certain will have applications beyond making televisions. I understand there was some perplexity as to whether the free travel time was the result of a mass reduction or something else.

Pictured here is hexagonal zinc oxide without the tin and indium.

Abstract

What is going on here is this: The indium and tin are periodic table neighbors; indium with three valence electrons and tin having four. I am assuming here that the indium is being placed on one side (the top) of the structure diagrammed here and the tin on the bottom. Zinc oxide in and of itself has piezoelectric properties that result from oxygen vacancies. The asymmetric adhesion of the indium on one side and the tin on the other results in a molecular torsion that results in a constant opposing-direction twist in the molecule but leaving in place an internal pathway for electrical flow, provided it is low in amperage.

I believe what we're seeing here is a form of room-temperature superconduction that results from curved charge density waves on the inside of the structure. There may be a limit, if I am correct, on the amount of power that can be passed through while preserving the effect. Nonetheless, if it is confirmed, this knowledge can built upon and used to further enhance the medium.

Conclusion

For high amperage superconduction, the best approach would still be to use, as I suggested previously, a combination of Coulomb and magnetic force lines to control lithium's internal magnetic field to generate stable charge density waves.

Note: For superconduction, this publication is outmoded by 1 January 2024.